

Date: Thursday, 18/12/2008 12:41:42 PM  
 User: Julie Dawson

## Process Sheet

<b>Customer</b> : CU-DAR001 Dart Helicopters Services	<b>Drawing Name</b> : 212/205 HIGH FED X-TUBE ASSEMBLY
<b>Job Number</b> : 44188	
<b>Estimate Number</b> : 13216	
<b>P.O. Number</b> :	<b>Part Number</b> : D212664101TRN
<b>This Issue</b> : 18/12/2008 <b>S.O. No.</b> :	<b>Drawing Number</b> : D212-664-141 REV C
<b>Prsht Rev.</b> : NC	<b>Project Number</b> : N/A
<b>First Issue</b> : / / <b>Type</b> : CROSSTUBES	<b>Drawing Revision</b> : C
<b>Previous Run</b> : 44187	<b>Material</b> :
<b>Written By</b> :	<b>Due Date</b> : 25/12/2008 <b>Qty:</b> 1 <b>Um:</b> Each
<b>Checked &amp; Approved By</b> : <u>JD 08.12.18</u>	
<b>Comment</b> : Est Rev A 08-03-06 new issue DD verified by: ec Est Rev B 08.04.02 removed Polish EC verified by: DD	

## Additional Product

Job Number:



<b>Seq. #:</b>	<b>Machine Or Operation:</b>	<b>Description :</b>
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1.0	D6005128	Crosstube Material
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**Comment:** Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6005-128 Crosstube B34275

Check OD = 2.750"; ID = 2.000"

A.m 09.01.06 (D)

2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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**Comment:** MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand &amp; install plugs DT8534 on both ends as per Folio FA113

2-Turn first side as per Folio FA113

3-File down transition lines smooth.

A.m 09.01.06 (D)

3.0	QC1	INSPECT ALL DIM TO DIM SHEET
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**Comment:** INSPECT ALL DIM TO DIM SHEET

A.m 09.01.06 (D)

4.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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**Comment:** MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA113

2-File down transition lines smooth.

3-Remove sand and plugs

A.m 09.01.06 (D)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Thursday, 18/12/2008 12:41:42 PM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212/205 HIGH FED X-TUBE ASSEMBLY

Job Number: 44188

Part Number: D212664101TRN

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

*Qm*

*09-01-06*

*1*

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

*AWM 9-01-06*

*1*

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

*MB 09-01-07*

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

*Qm*

*09-01-07*

9.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock in kanban rack

Location:

*X-tube cell*

*MB*

*09-01-07*

*1*

10.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

*09-01-08*

Job Completion



*MF 09-01-08*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

## 5.0 PARTS LIST

Item	634 -011	634 -015	634 -041	634 -045	641 -011	Part Number	Description
	X					D205-634-011	SKIDTUBE INSTALLATION (STANDARD)
		X				D205-634-015	SKIDTUBE INSTALLATION (MODIFIED)
	1		X			D205-634-041	SKIDTUBE
		1		X		D205-634-045	SKIDTUBE
	1	1			X	D205-641-011	GROUND HANDLING KIT
1			1			D2580-041	205 SKIDTUBE ASSEMBLY (STANDARD)
1				1		D2580-045	205 SKIDTUBE ASSEMBLY (MODIFIED)
2A			16	16		D2594-1	* PLUG
2B			16	16		D2594-3	* O-RING
3			1	1		D2855	* AFT CAP
4			2	2		AN3-5A	* BOLT
5			2	2		AN960JD10L	* WASHER
6A			1	1		D3564-9	* WEARSHOE (REPLACES D2577-1)
6B			1	1		D3566-1	* GASKET
7A			1	1		D3564-11	* WEARSHOE (REPLACES D2577-3)
7B			1	1		D3566-1	* GASKET
8A			1	1		D3564-5	* WEARSHOE (REPLACES D2577-5)
8B			1	1		D3566-5	* GASKET
9A			1	1		D3564-13	* WEARSHOE
9B			1	1		D3566-13	* GASKET
10			50	50		AN3C4A	* BOLT (REPLACES AN3-4A)
11			50	50		AN960C10L	* WASHER (REPLACES AN960JD10L)
12			50	50		ALS4-1032-130	* INSERT
13			2	2		ALS4-1032-225	* INSERT
20	1	1				D2571	SADDLE, FWD OUTSIDE
21	1	1				D2572	SADDLE, FWD INSIDE
22	1	1				D2573	SADDLE, AFT OUTSIDE
23	1	1				D2574	SADDLE, AFT INSIDE
24	8	8				AN4-51A	BOLT
25	16	16				D2570	BUSHINGS
26	8	8				MS21042L4	NUT (OR MS21042-4)
27	8	8				AN6-12A	BOLT
28	8	8				AN960JD616	WASHER
29	16	16				AN4-6A	BOLT
30	32	32				AN960JD416	WASHER
31	16	16				MS21042L4	NUT (OR MS21042-4)
32	4	4				D2747	SET SCREW
33	2	2				D3533-1	SET SCREW
40	1	1				D2968-041	TOW RING
41	1	1				AN970-4	WASHER
43	1	1				MS21042L4	NUT (OR MS21042-4)
50					1	D2736-1	GHW LUG
51					1	D2736-3	GHW LUG
52					4	AN4-46A	BOLT
53					8	D2570	BUSHING
54					4	MS21042L4	NUT (OR MS21042-4)
60	2	2				D2876	SADDLE SPACER
61	2	2				D2877	SADDLE SPACER

\*DENOTES THAT PART IS INCLUDED WITH ASSEMBLY ABOVE

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Revision: E

Date: 08.04.15

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WORK ORDER

NO. 111/88

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 44188
<b>Description:</b> Crosstube Assembly (205/212/412 High Fwd)		<b>Part Number:</b> D212-664-141
<b>Inspection Dwg:</b> D212-664-141 <b>Rev:</b> C		<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	0.200	—			
	R0.063	+/-0.010	R0.063	—			
	2.740	+0.005/-0.000	2.745	—			
	5.097	+/-0.030	5.097	—			
	2.304	+0.005/-0.000	2.309	—			
	2.340	+0.005/-0.000	2.345	—			
	2.398	+0.005/-0.000	2.403	—			
	2.448	+0.005/-0.000	2.453	—			
	2.498	+0.005/-0.000	2.503	—			
	2.549	+0.005/-0.000	2.554	—			
	2.599	+0.005/-0.000	2.604	—			
	2.671	+0.005/-0.000	2.676	—			
	2.701	+0.005/-0.000	2.706	—			
SIDE B	0.200	+/-0.010	0.200	—			
	R0.063	+/-0.010	R0.063	—			
	2.740	+0.005/-0.000	2.743	—			
	5.097	+/-0.030	5.097	—			
	2.304	+0.005/-0.000	2.309	—			
	2.340	+0.005/-0.000	2.345	—			
	2.398	+0.005/-0.000	2.403	—			
	2.448	+0.005/-0.000	2.453	—			
	2.498	+0.005/-0.000	2.503	—			
	2.549	+0.005/-0.000	2.554	—			
	2.599	+0.005/-0.000	2.604	—			
	2.671	+0.005/-0.000	2.676	—			
	2.701	+0.005/-0.000	2.706	—			
	126.51	+/-0.020	126.510	—			
	126.52						

<b>Measured by:</b> a.m	<b>Audited by:</b> ALM	<b>Prototype Approval:</b>	N/A
<b>Date:</b> 09.01.07	<b>Date:</b> 7-1-7	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-101)	KJ/JLM	
B	06.03.15	Tolerance revised for 5.097 per Dwg Rev update	KJ/JLM	
C	07.05.28	Dwg Rev updated	KJ/JLM	



DESIGN <b>PH</b>	DRAWN BY <b>PH</b>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <b>GP</b>	APPROVED <b>[Signature]</b>	DRAWING NO. D212-664-141	REV. C SHEET 1 OF 3
DATE 07.03.08		TITLE XTUBE ASS'Y (205/212/412 HI FWD) NTS	
A	00.12.12	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	07.03.08	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	

RELEASED

07.04.24

Qty	Part Number	Description
X	D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
1	D6005-128	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
4	MS21920-25	CLAMP (OR MS21920-26)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6005-128  
FINISHED LENGTH =  $126.51 \pm 0.020$
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 10) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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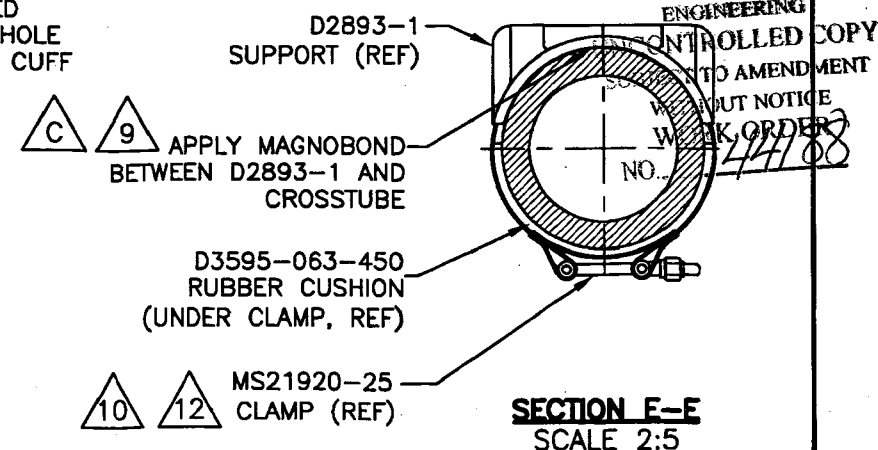
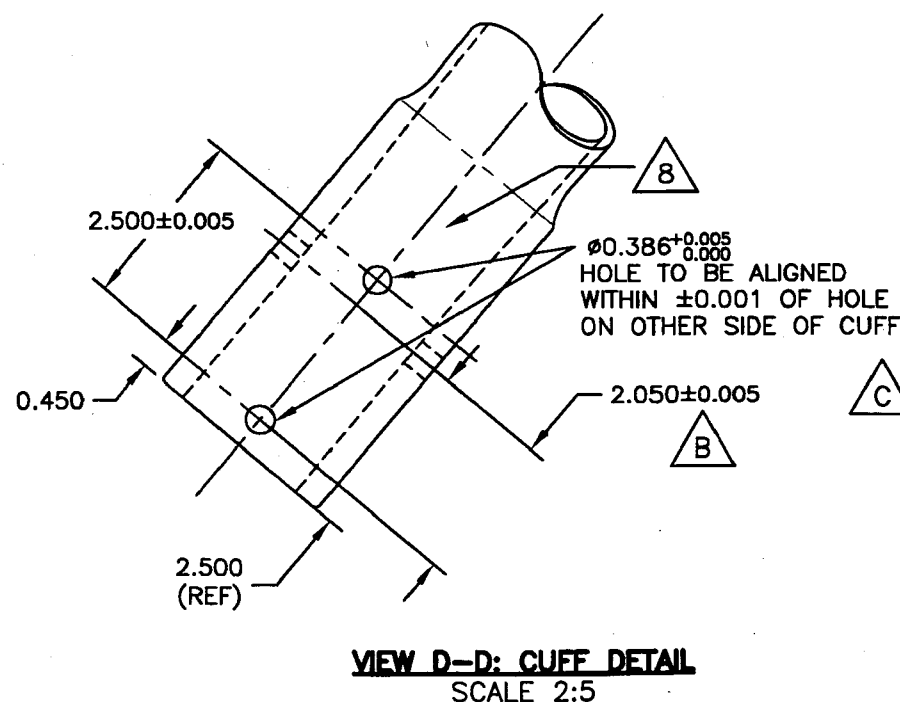
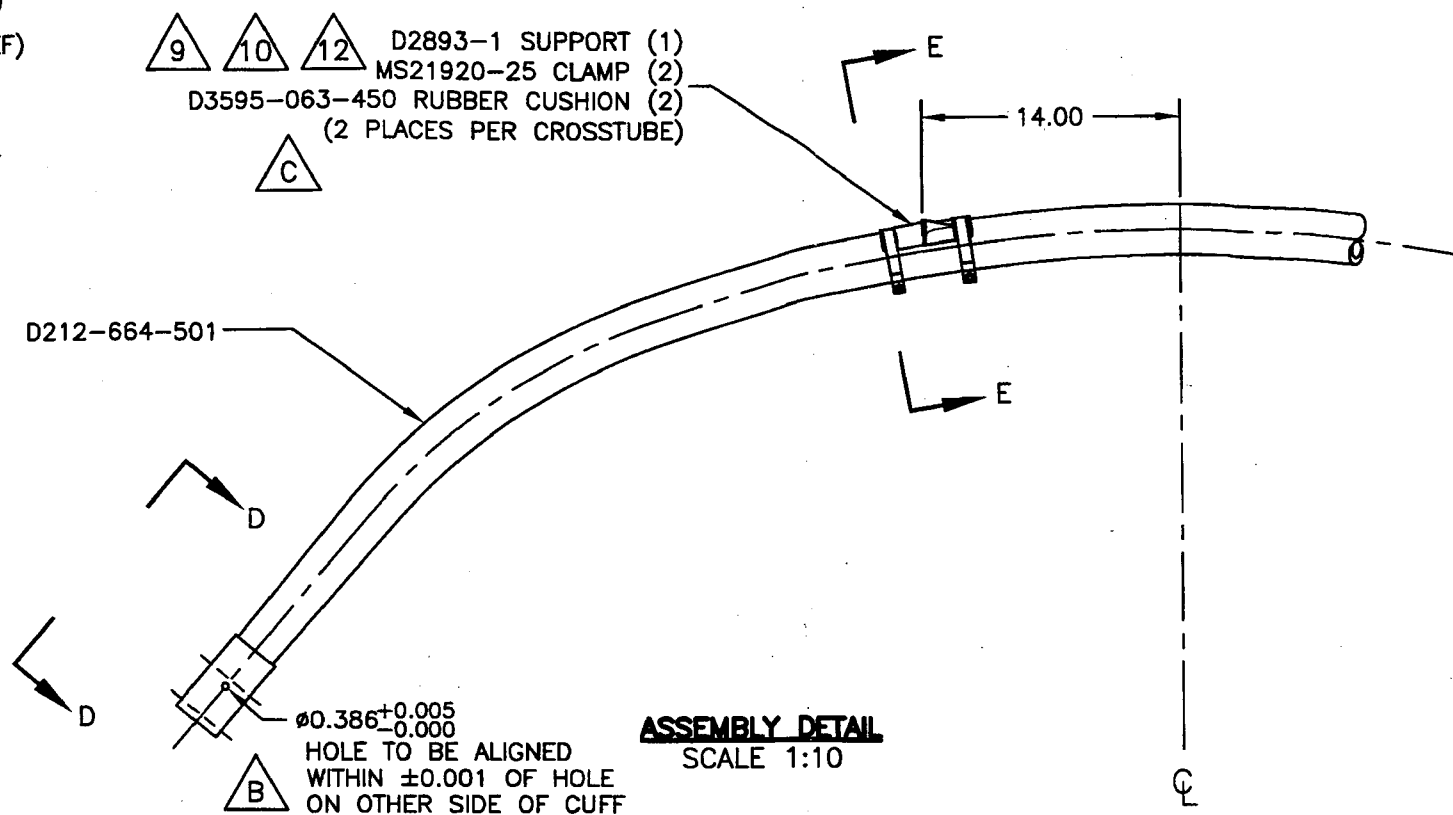
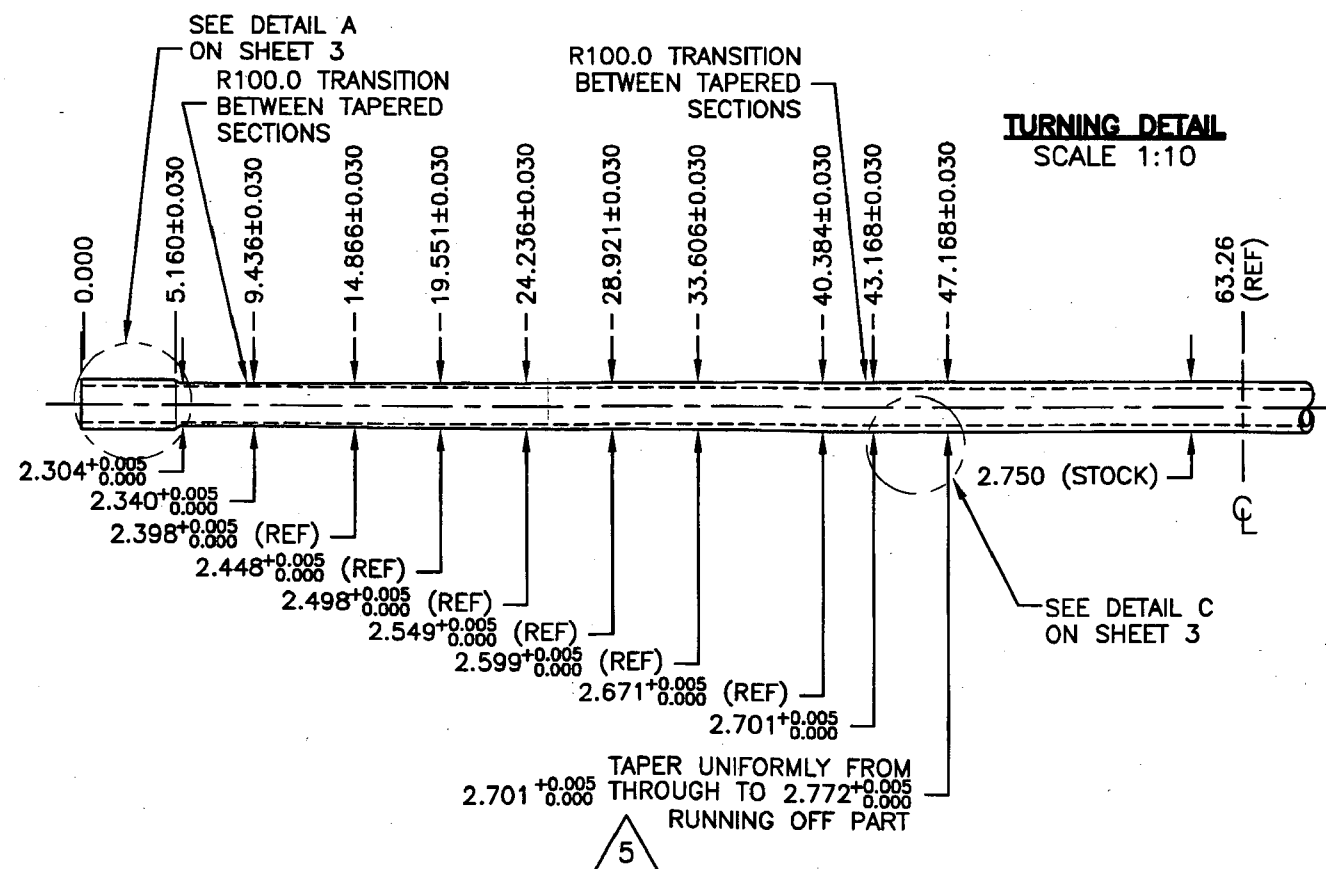
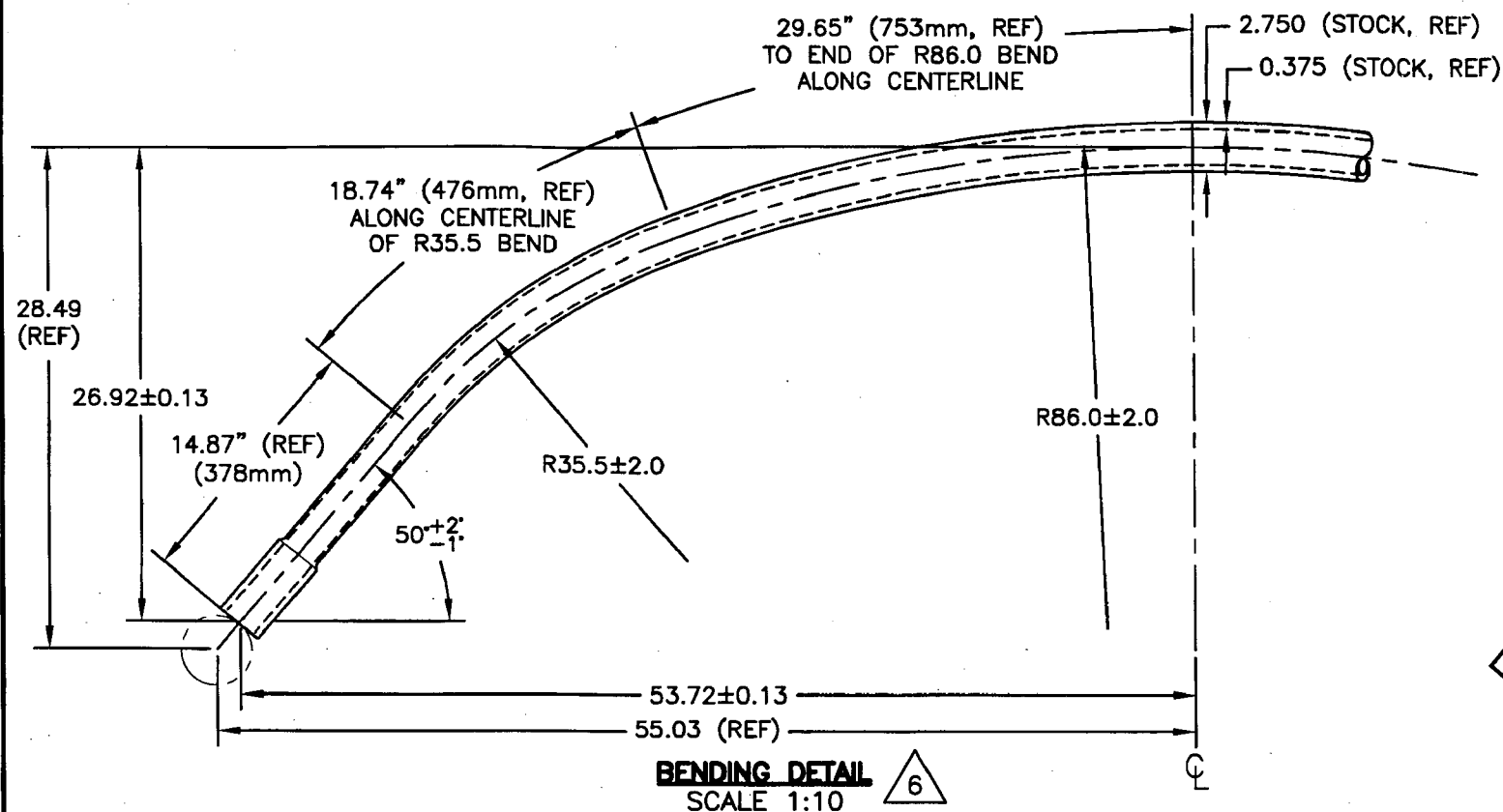
NO

44188

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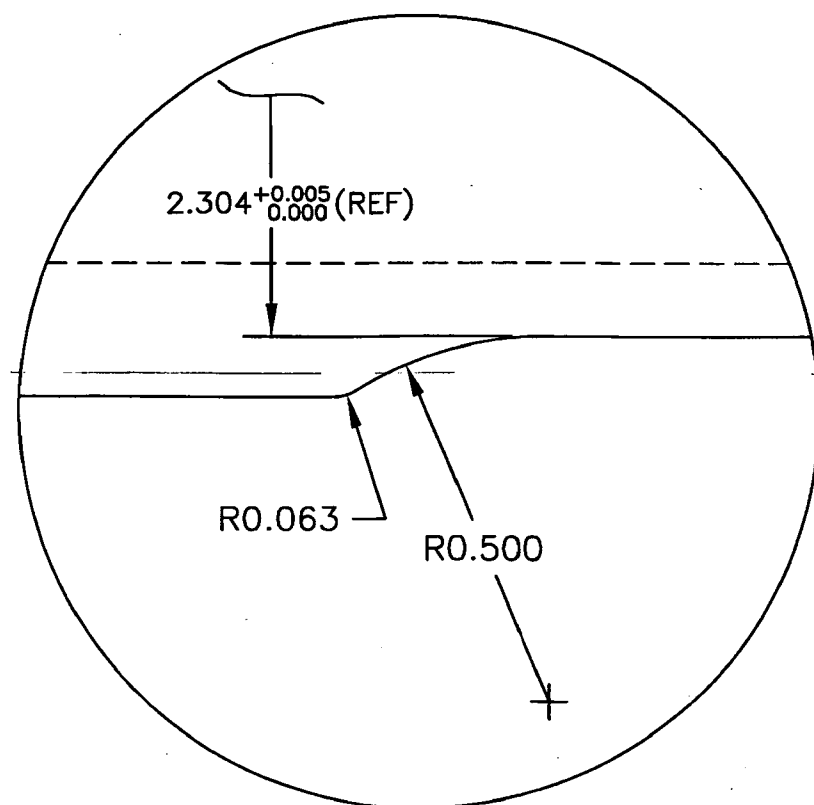
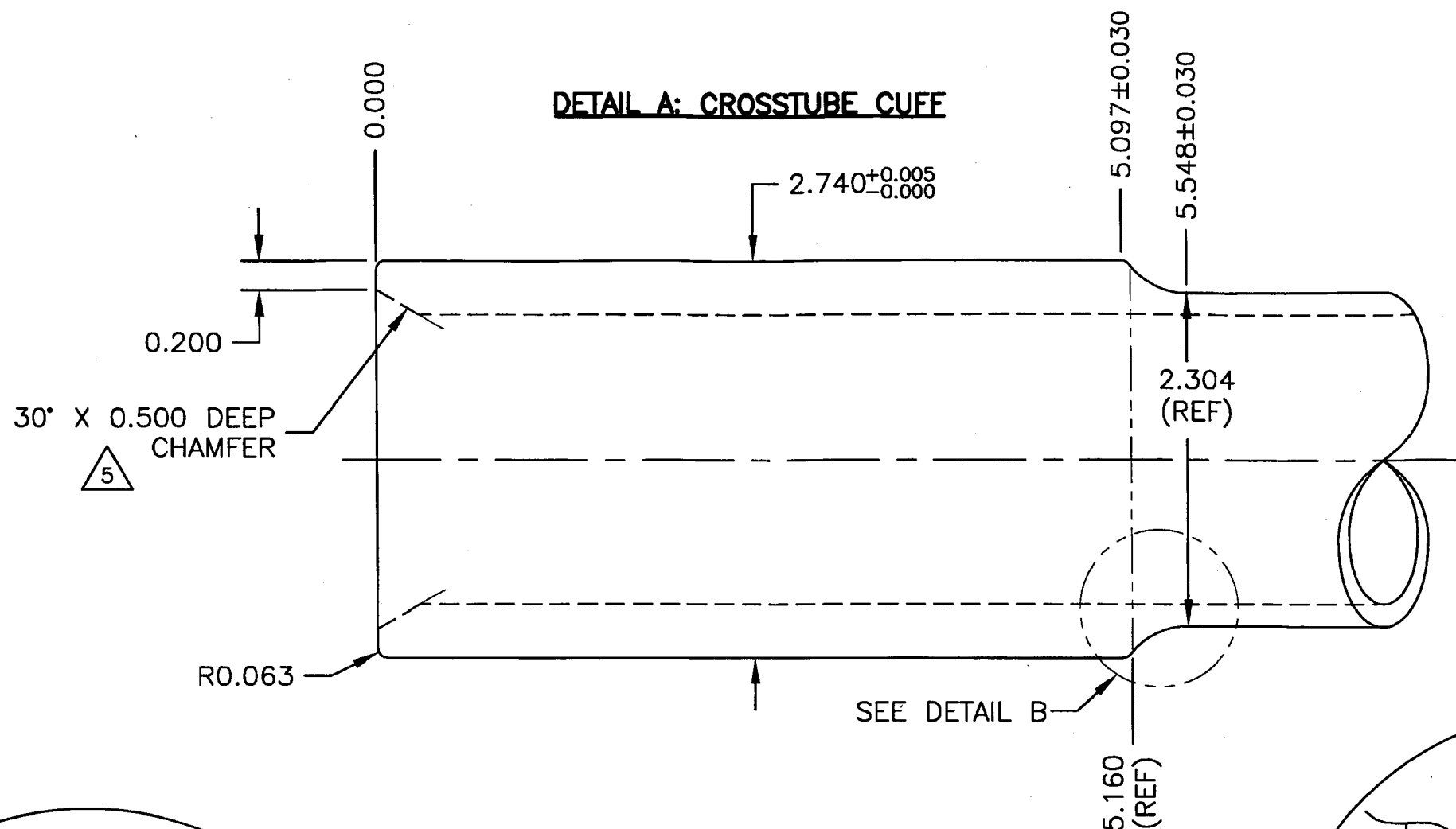
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DESIGN PH	DRAWN BY PH	<b>DART</b>	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED 92	APPROVED H	DRAWING NO. D212-664-141	REV. C SHEET 2 OF 3
DATE 07.03.08	TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE 1:10	

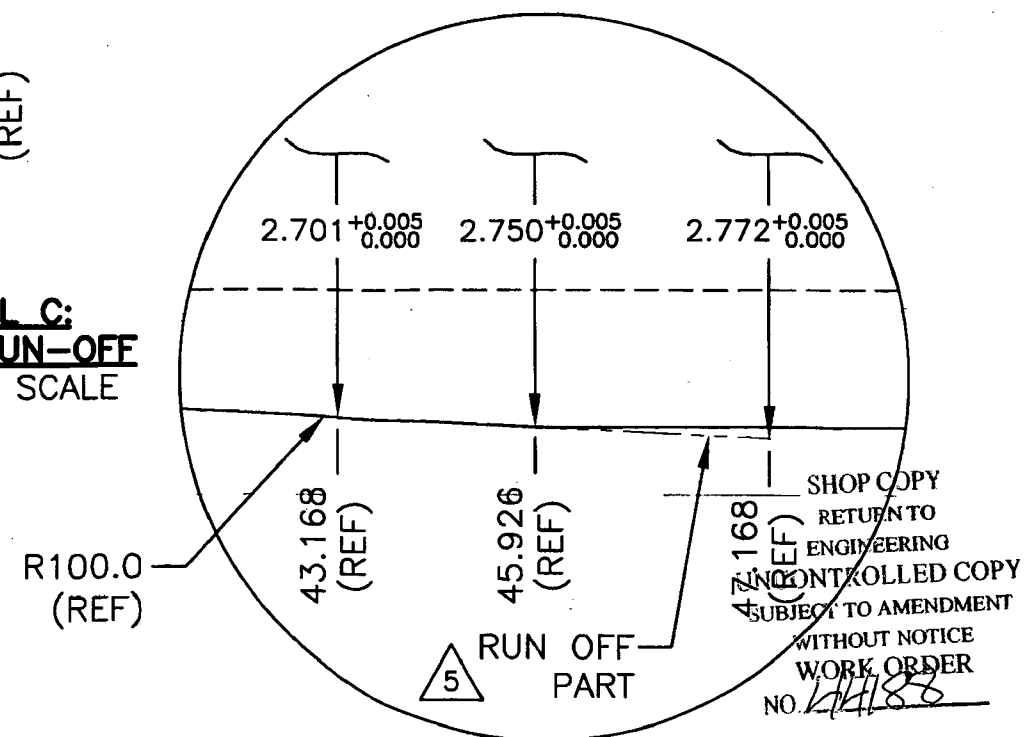
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 97.04.24 CP  
 PER ELN 887

**DETAIL A: CROSSTUBE CUFF**



**DETAIL B: CUFF  
 TRANSITION  
 SCALE 4:1**

**DETAIL C:  
 TAPER RUN-OFF  
 NOT TO SCALE**



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PH

DRAWN BY

PH

**DART**

**DART AEROSPACE LTD.**  
 HAWKESBURY, ONTARIO, CANADA

CHECKED

J

APPROVED

J

DRAWING NO.  
 D212-664-141

REV. C

DATE

07.03.08

TITLE

XTUBE ASS'Y (205/212/412 HI FWD)

SCALE

1:1

SHEET 3 OF 3

